

# MSW 4V rs and MSW 4SV rs

Mini Video Switchers



**Extron® Electronics**  
INTERFACING, SWITCHING AND CONTROL

## Safety Instructions • English



This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.



This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product enclosure that may present a risk of electric shock.

### Caution

**Read Instructions** • Read and understand all safety and operating instructions before using the equipment.

**Retain Instructions** • The safety instructions should be kept for future reference.

**Follow Warnings** • Follow all warnings and instructions marked on the equipment or in the user information.

**Avoid Attachments** • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

## Consignes de Sécurité • Français



Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).



Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

### Attention

**Lire les instructions** • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

**Conserver les instructions** • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

**Respecter les avertissements** • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

**Eviter les pièces de fixation** • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

## Sicherheitsanleitungen • Deutsch



Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.



Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

### Achtung

**Lesen der Anleitungen** • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.

**Aufbewahren der Anleitungen** • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

**Befolgen der Warnhinweise** • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

**Keine Zusatzeräte** • Verwenden Sie keine Werkzeuge oder Zusatzeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

## Instrucciones de seguridad • Español



Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.



Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

### Precaucion

**Leer las instrucciones** • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

**Conservar las instrucciones** • Conservar las instrucciones de seguridad para futura consulta.

**Obedecer las advertencias** • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

**Evitar el uso de accesorios** • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrían implicar riesgos.

## 安全须知 • 中文



这个符号提示用户该设备用户手册中有重要的操作和维护说明。



这个符号警告用户该设备机壳内有暴露的危险电压, 有触电危险。

### 注意

**阅读说明书** • 用户使用该设备前必须阅读并理解所有安全和使用说明。

**保存说明书** • 用户应保存安全说明书以备将来使用。

**遵守警告** • 用户应遵守产品和用户指南上的所有安全和操作说明。

**避免追加** • 不要使用该产品厂商没有推荐的工具或追加设备, 以避免危险。

## Warning

**Power sources** • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

**Power disconnection** • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

**Power cord protection** • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

**Servicing** • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

**Slots and openings** • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

**Lithium battery** • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the instructions of the manufacturer.

## Avertissement

**Alimentations** • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de contourner ni de la désactiver.

**Déconnexion de l'alimentation** • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordon d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

**Protection du cordon d'alimentation** • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

**Réparation-maintenance** • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à des haute tensions et autres dangers.

**Fentes et orifices** • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

**Lithium Batterie** • Il a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

## Vorsicht

**Stromquellen** • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

**Stromunterbrechung** • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

**Schutz des Netzkabels** • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegenstellt werden können.

**Wartung** • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, diese Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

**Schlitz und Öffnungen** • Wenn das Gerät Schlitz oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

**Lithium-Batterie** • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

## Advertencia

**Alimentación eléctrica** • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearla ni eliminarla.

**Desconexión de alimentación eléctrica** • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

**Protección del cables de alimentación** • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

**Reparaciones/mantenimiento** • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

**Ranuras y aberturas** • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

**Batería de litio** • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Descharar las baterías usadas siguiendo las instrucciones del fabricante.

## 警告

**电源** • 该设备只能使用产品上标明的电源。设备必须使用有地线的供电系统供电。第三条线(地线)是安全设施, 不能不用或跳过。

**拔掉电源** • 为安全地从设备拔掉电源, 请拔掉所有设备后或桌面电源的电源线, 或任何接到市电系统的电源线。

**电源线保护** • 妥善布线, 避免被踩踏, 或重物挤压。

**维护** • 所有维修必须由认证的维修人员进行。设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

**通风孔** • 有些设备机壳上有通风槽或孔, 它们是用来防止机内敏感元件过热。不要用任何东西挡住通风孔。

**锂电池** • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

## FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the user guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

**NOTE:** This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance with FCC emissions limits.

For more information on safety guidelines, regulatory compliances, EMI/EMF compliance, accessibility, and related topics, [click here](#).

## Conventions Used in this Guide

In this user guide, the following are used:

**TIP:** A tip provides a suggestion to make working with the application easier.

**NOTE:** A note draws attention to important information.

**CAUTION:** A caution indicates a potential hazard to equipment or data.

**WARNING:** A warning warns of things or actions that might cause injury, death, or other severe consequences.

**Commands** are written in the fonts shown here:

```
^AR Merge Scene,,0p1 scene 1,1 ^B51 ^W^C  
[01] R 0004 00300004000080000600 [02] 35 [17] [03]  
[Esc] [X1] * [X17] * [X20] * [X23] * [X21] CE ←
```

**NOTE:** For commands and examples of computer or device responses mentioned in this guide, the character “Ø” is used for the number zero and “O” represents the capital letter “o.”

**Computer responses** and **directory paths** that do not have variables are written in the font shown here:

```
Reply from 208.132.180.48: bytes=32 times=2ms TTL=32  
C:\Program Files\Extron
```

**Variables** are written in slanted form as shown here:

```
ping xxx.xxx.xxx.xxx -t  
SOH R Data STX Command ETB ETX
```

**Selectable items**, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

From the **File** menu, select **New**.

Click the **OK** button.

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## Trademarks

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# Introduction

This guide describes the function, installation and operation of the Extron MSW 4V rs and MSW 4SV rs mini video switchers. Unless otherwise stated, the terms "MSW" and "switcher" refer to both models.

## About the MSW 4V rs and MSW 4SV rs Switchers

The Extron MSW 4V rs and MSW 4SV rs are four-input, two parallel output, mini video switchers (MSWs).

The MSW 4V rs switches between a maximum of four NTSC, PAL, or SECAM composite video inputs on female BNC connectors and produces two identical video outputs on female BNC connectors (see [figure 1](#) on page 2). The video output is a buffered, composite signal.

The MSW 4SV rs switches four S-video (luminance [Y] and chrominance [C]) inputs on 4-pin mini DIN connectors. The selected S-video input is split, buffered, and output on two connectors (see [figure 2](#) on page 2):

- One S-video output on a 4-pin mini DIN connector
- One composite video output on a female BNC connector

These mini video switchers can be operated from the front panel or via a contact closure device connected to the rear panel, such as an Extron CCR 204 Four-Button Contact Closure Remote or an IR 102 Remote Control Kit. The MSW Series include RS-232 communication, allowing control via the Extron Simple Instruction Set (SIS™) or the Universal Switcher Control Program software.

They also feature a front panel selectable auto switch mode that automatically switches to the highest numbered input that has an active sync pulse present.

## Features

**Inputs** — four female 4-pin mini DIN connectors for S-video or four female BNC connectors for composite video

**Outputs** — one BNC and one 4-pin mini DIN for S-video or two BNC connectors for composite video (both models feature two parallel outputs for simultaneous monitor and projector viewing)

**Video Mute** — the video output can be muted using front panel controls

**Serial control** — through an RS-232 port

**Video compatibility** — with NTSC, PAL, and SECAM video formats

**Non-volatile memory** — Retains unit settings after power loss

**Firmware upgrades** — available for download from the [Extron Website](#).

**Remote control** — through contact closure

**Ability to detect an active signal**

**Built-in video encoder (MSW 4SV rs model only)** — for composite video output

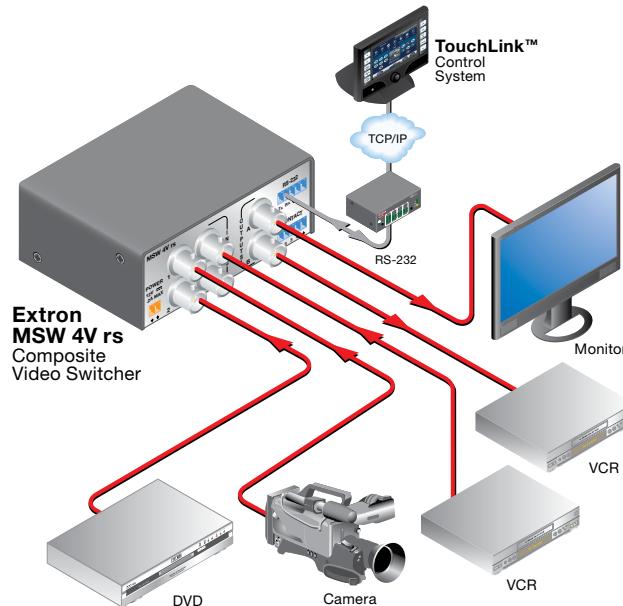
**Auto switching** — when enabled, automatically selects the highest numbered input with video sync present

**Vertical interval switching** — ensures glitch-free transitions

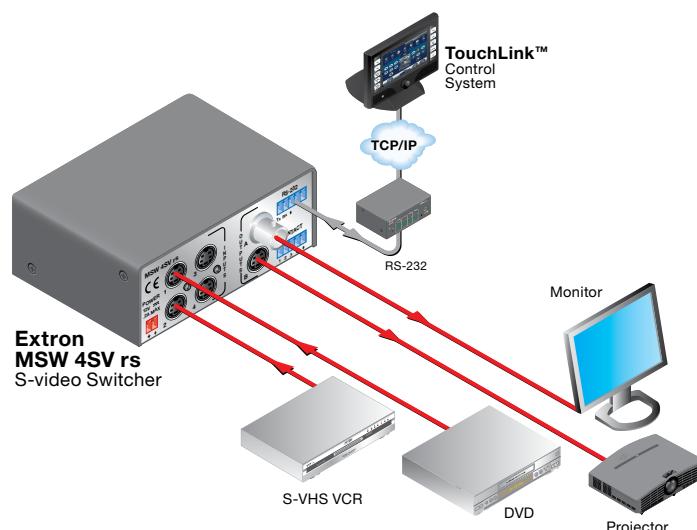
**Compact size** — 1U, quarter rack width metal enclosure

**External power supply** — the MSW 4V rs and MSW 4SV rs units are powered by a 12 VDC, 1.0 A power supply

## Application Diagrams



**Figure 1.** Typical Application for the MSW 4V rs



**Figure 2.** Typical Application for the MSW 4SV rs

# Installation Overview

This section provides brief instructions for installing and operating either the MSW 4V rs or the MSW 4SV rs switcher. Users are advised to follow the links to obtain more information, elsewhere in this guide, about each step.

- Mount the switcher** in a suitable location.
- Connect the **composite** and **S-video** (MSW 4SV rs only) inputs to video sources.
- Connect the **composite** and **S-video** (MSW 4SV rs only) outputs to video displays.
- Connect the power supply** (provided).

**CAUTION:** Read the **cautions** on page 6 before connecting a power supply to the switcher.

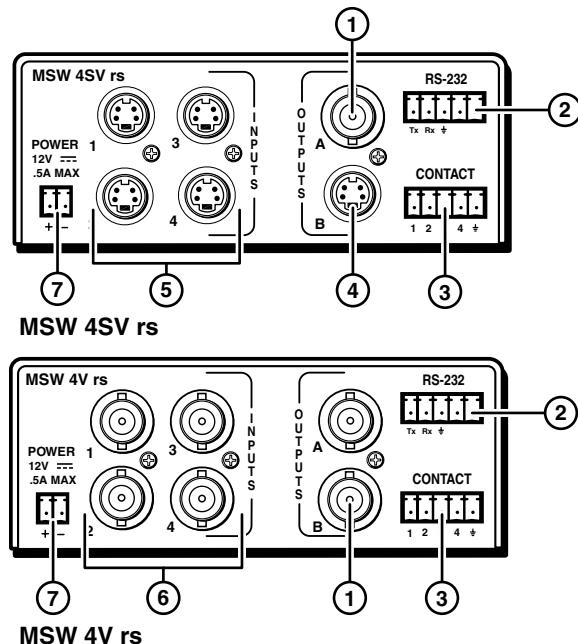
- Connect the RS-232 captive screw connector** to a control device such as a computer or IP Link controller (for use with an Extron TouchLink panel).
- Connect the Contact captive screw connector** as required.
- Power on the switcher and all connected devices.
- Set up the **auto switching mode** and **video mute**. These can be initiated through the front panel buttons, the **Universal Switcher Control Program**, or by **SIS commands**.
- Select an input channel.**

# Panel Features

This section describes:

- [Rear Panel Connections](#)
- [Front Panel Controls and Indicators](#)

## Rear Panel Connections



**Figure 3. MSW 4SV rs and MSW 4V rs Rear Panel Connections**

**NOTE:** The MSW switches during the vertical interval of input 1. For seamless switching, ensure one of the genlocked devices is connected to input 1.

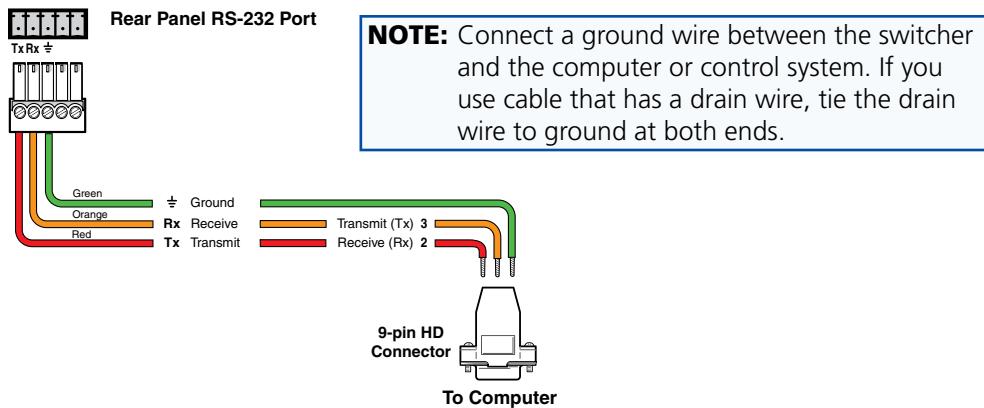
① **Composite video outputs (both switcher models)** — For each composite video output, connect a composite video display or other output device to this BNC connector.

**NOTES:**

- Outputs A and B output only one selected input signal.
- Both outputs can be used simultaneously.
- The MSW 4SV has a built-in encoder to convert S-Video to composite video (output A).

② **RS-232 connector** — Connect a cable with a 3.5 mm, 5-pole captive screw connector to this port for bidirectional RS-232 communication. Wire the connectors as shown below.

**NOTE:** The Tx pin on the switcher connects to the Rx connector on the PC; the Rx pin on the switcher connects to the Tx connector on the PC.

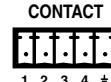


**Figure 4. RS-232 Connector Wiring**

This port has the following RS-232 protocol:

- 9600 baud
- 1 stop bit
- No parity
- 8 data bits

See “[Command and Response Table for SIS Commands](#)” on page 19 for the SIS commands used to communicate with the MSW switcher with RS-232.



③ **Contact connector** — Connect a remote contact closure device to the MSW for remote control of the switcher. You can also daisy chain the unit to other MSWs using this 5-pole captive screw connector. This allows remote control of the other switchers.

**NOTE:** The switcher must be in normal (manual) mode for contact closure to work (see “[Mode Selection](#)” on page 8).

To select an input using a contact closure device, such as an Extron CCR 204 Contact Closure Remote Control or a locally constructed device, momentarily short the pin for the desired input number to logic ground (pin 5). To force one of the inputs to be always selected, leave the short in place. The short overrides any front panel input selections.

You can also daisy chain multiple MSWs by using the contact connector. This allows for front panel control of all switchers (for example, touch the input button on one MSW to switch all MSWs). Wire pin 1 to pin 1, pin 2 to pin 2, and so on.

④ **S-video output (MSW 4SV rs only)** — Connect an S-video display or other device to this 4-pin mini DIN connector for the S-video output.

⑤ **S-video inputs 1 through 4 (MSW 4SV rs only)** — For each input, connect an S-video source to one of these 4-pin mini DIN connectors.

⑥ **Composite video inputs 1 through 4 (MSW 4V rs only)** — For each input, connect a composite video source to one of these BNC connectors.

⑦ **Power connector** — Plug the external 12 VDC power supply into this 2-pole, 3.5 mm captive screw connector. The power supply is included with the unit.

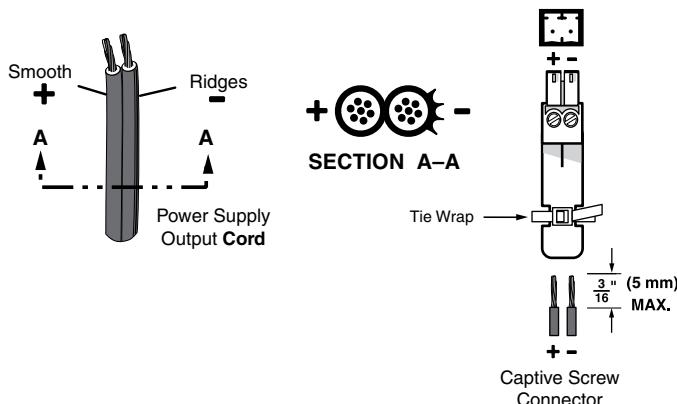
If power is disconnected from the MSW, the unit retains mode and input settings.

**CAUTIONS:**

- Always use a power supply supplied by or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the end product.
- Unless otherwise stated, the AC/DC adapters are not suitable for use in air handling spaces or in wall cavities. The power supply is to be located within the same vicinity as the Extron A/V processing equipment in an ordinary location, Pollution Degree 2, secured to the equipment rack within the dedicated closet, podium or desk.
- The installation must always be in accordance with the applicable provisions of National Electrical Code ANSI/NFPA 70, article 75 and the Canadian Electrical Code part 1, section 16. The power supply shall not be permanently fixed to building structure or similar structure.

To wire the connector, do the following:

1. Cut the DC output cord to the length needed.
2. Strip the jacket to expose 3/16 inch (5 mm) of the conductors.



**Figure 5. Power Supply Connection**

**NOTES:**

- The power connector on the rear panel is orange; however, the plug for the provided power cord may be either orange or blue. Either color plug can be connected to the rear panel receptacle.
- The length of the exposed wires in the stripping process is critical. The ideal length is 3/16 inches (5 mm). Any longer and the exposed wires may touch, causing a short circuit between them. Any shorter and the wires can be easily pulled out even if tightly fastened by the captive screws.
- Do not tin the wires. Tinned wire does not hold its shape and can become loose over time.

3. Slide the leads into the supplied captive screw plug and secure them using a small screwdriver.

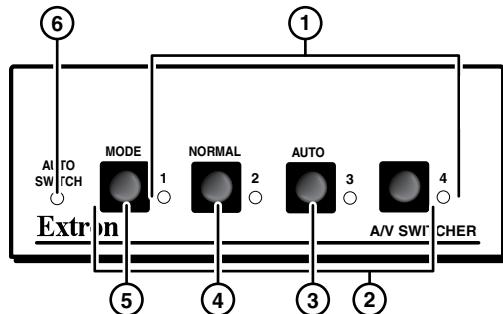
4. Use the supplied tie-wrap to strap the power cord to the extended tail of the connector.
5. Before connecting the power cord, verify the polarity by plugging it into the power supply with no load and checking the output with a voltmeter.

**WARNING** The two power cord wires must be kept separate while the power supply is plugged in. Remove power before wiring.

Alternately, an Extron PS 124 Universal 12 VDC power supply (part number **60-1022-01**) can power up to eight MSWs or other Extron 12 VDC devices using only one AC power connector.

## Front Panel Controls and Indicators

The MSW 4V rs and MSW 4SV rs have identical front panels, shown in figure 6.



**Figure 6. MSW 4V rs and MSW 4SV rs Front Panel**

### Input Selection

- ① **Input 1 through 4 LEDs** — The Input LEDs light to identify the selected input.
- ② **Input 1 through 4 buttons** — Each Input button selects the associated input for output.

The Input 1 (⑤), Input 2 (④), and Input 3 (③) buttons are also used to toggle auto switch mode on and off. See the following section.

### Auto Switch Mode Controls and Indicators

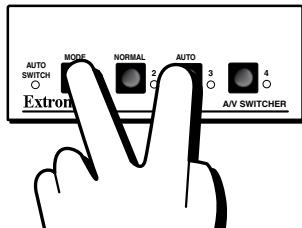
When auto switch is activated, the switcher automatically detects and selects the highest numbered input with video sync present.

- ③ **Auto (switch) button** — The Auto button is used with the Mode button (⑤) to select auto switch mode. Auto is a secondary function of the Input 3 button.
- ④ **Normal button** — The Normal button is used with the Mode button (⑤) to select normal mode. Normal is a secondary function of the Input 2 button.
- ⑤ **Mode button** — The Mode button is used with the Normal button (④) or Auto button (③) to select the switching mode. Mode is a secondary function of the Input 1 button. See “[Mode selection](#)” on the next page.
- ⑥ **Auto Switch LED** — When lit, the Auto Switch LED indicates that the switcher is in auto switch mode. In this mode, the MSW automatically switches to the highest numbered input with active sync pulses. When this LED is unlit, the switcher is in normal (manual) mode.

## Mode Selection

The default method for changing channels is Normal mode (using front panel buttons). To activate auto switch mode:

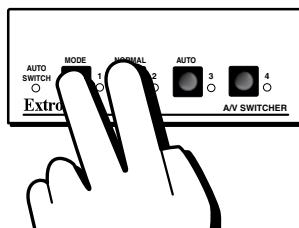
1. Press and hold the Mode (Input 1) and Auto (Input 3) buttons simultaneously.
2. Release the Mode and Auto buttons simultaneously. The Auto Switch LED turns on, indicating that auto switch is enabled.



**Figure 7. Turning on Auto Switch Mode**

To turn auto switch mode off (Normal mode):

1. Press and hold the Mode (Input 1) and Normal (Input 2) buttons simultaneously.
2. Release the Mode and Normal buttons simultaneously. The Auto Switch LED is unlit and the MSW switches to the previously selected input



**Figure 8. Turning off Auto Switch Mode**

## Output (Video) Mute

Video mute suppresses video signals being sent to either output.

1. Press and hold the Mode (Input 1) and Input 4 buttons simultaneously.
2. Release both buttons simultaneously. The output (video) signal is muted.

To restore the video signal, press the same buttons:

1. Press and hold the Mode (Input 1) and Input 4 buttons simultaneously.
2. Release both buttons simultaneously. The output (video) signal is restored.

## Vertical Interval Switching

The MSWs switch inputs during the vertical interval of the video signal that is on input 1. In a genlocked system, switching to any input is glitch-free if one of the genlocked devices is connected to input 1.

# Control Software

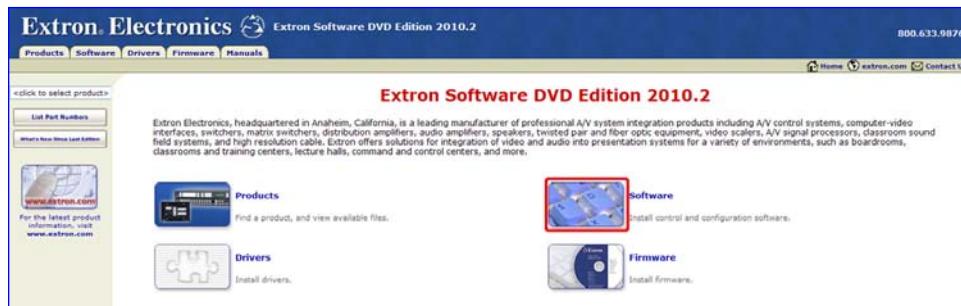
## Universal Switcher Control Program

The Windows®-based Extron Universal Switcher Control Program provides an alternative to configuring and operating the switcher through the **front panel** or **SIS commands**. The program is compatible with Windows 2000 or later versions of the Windows operating system.

### Installing the Software

The control program can be downloaded from the **Extron Website** and is on the Extron Software Products DVD. Install the software from the DVD as follows:

1. Insert the DVD into the drive. The installation program should start automatically. If it does not self-start, run Launch.exe from the disc. The Extron software DVD window appears.



**Figure 9.** Extron Software DVD Opening Screen

2. Click the Software icon.
3. Scroll to the Universal Switcher Control program and click the **Install** link at right.



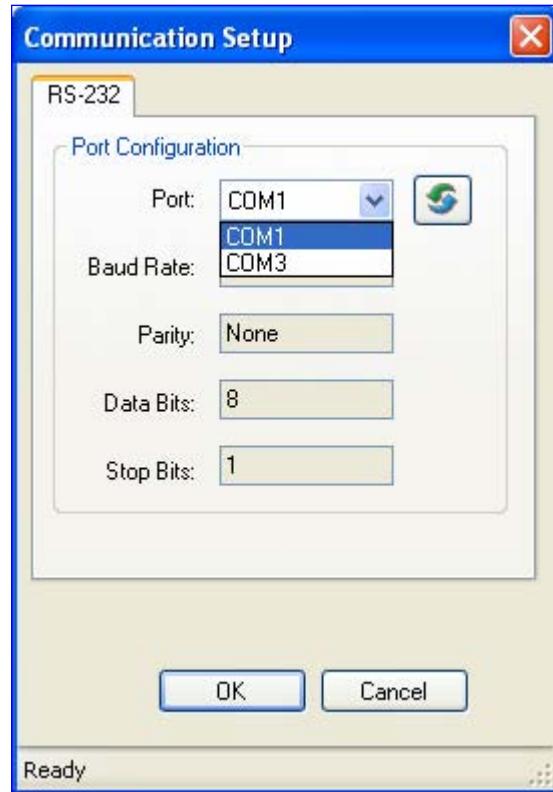
**Figure 10.** Universal Switcher Install Link

By default, the Windows installation creates a C:\Program Files\Extron\UnivSW folder and places a Universal Switcher icon onto the desktop.

Visit the Extron Web site ([www.extron.com/download](http://www.extron.com/download)) if the disk is unavailable for installation or to check if new software is available.

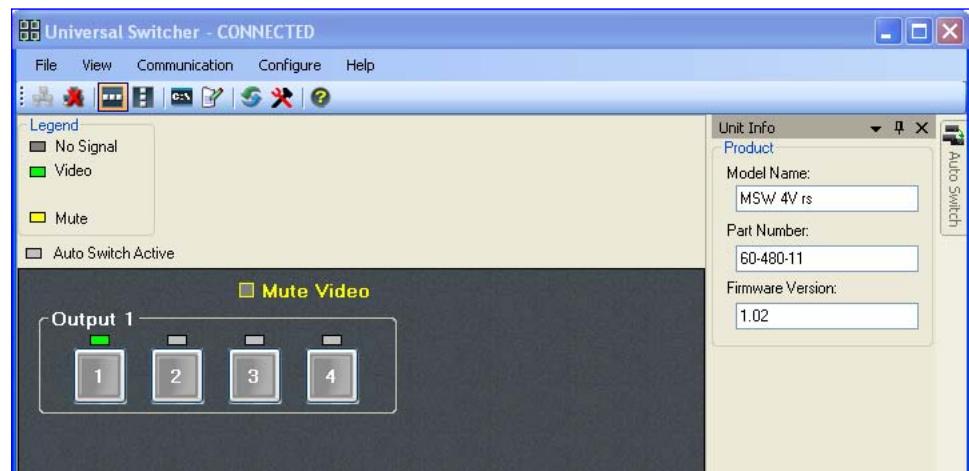
## Using the Software

1. To run the software, double-click the Universal Switcher Control Program icon on your PC desktop.
2. In the Communication Setup window (see figure 11), select the comm port that is connected to the RS-232 port on the MSW. Click **OK**.



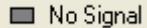
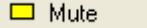
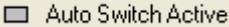
**Figure 11. Communication Setup Window**

3. The Universal Switcher Control Program window displays the selected input and switching mode (Front Panel or Auto Switch).



**Figure 12. Universal Switcher Output Window**

4. Select and click the desired input button. Symbols for the state of each LED are shown below:

 No Signal	Indicates that the input signal is not present and not selected
 Video	Indicates that the input signal is selected
 Mute	Suppresses the video image
 Auto Switch Active	When unlit (as shown), the switcher is in normal mode; when lit (green), the switcher is in auto switch mode

5. Click on the Auto Switch tab in the top right corner to reveal the Auto Switch status box. The Auto Switch radio buttons indicate which mode is currently selected.



6. Click the Mute Video check box to suppress the video image.



## Using the Help File

For information on how to use the Universal Switcher Control Program and explanations of its features and functions, access the help program using any of the following methods:

- On your desktop Start menu, click **Start > All Programs > Extron Electronics > Universal Switcher > Universal Switcher Help**.
- From within the switcher control program, select **Help > Contents** on the task bar.
- With the switcher control program open, press the **<F1>** key.

## Updating the Firmware

### Downloading the MSW 4V rs and 4SV rs Firmware

Extron periodically updates product firmware in conjunction with the release of new software revisions. When updating any Extron software to the latest revision level, please be sure to read the supplied release notes, or contact an Extron Application Engineer to determine if your Extron product requires a firmware update (see the [Extron Website](#) for contact information).

To find the latest MSW firmware, do the following:

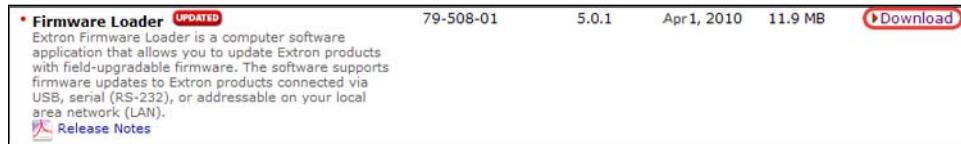
1. Go to [www.extron.com/download](http://www.extron.com/download).
2. In the sidebar menu, click **Firmware**.
3. Find the MSW 4 rs series on the alphabetical list (you may need to click the "Next" arrow).
4. Click the **Download** link for the product series and follow the instructions that appear on the screen.
5. The file will be saved onto your computer. Note the folder where you saved the firmware file.

**CAUTION:** Do not interrupt the firmware upload before it is 100% complete. Interrupting the upload corrupts the firmware and the switcher will not operate properly afterwards. If you experience problems with this procedure, call the [Extron S<sup>3</sup> Sales and Technical Support Hotline](#).

## Downloading and Installing the Firmware Loader

Extron recommends using the Firmware Loader software to update the firmware on the MSW 4V rs and MSW 4SV rs. If you do not already have the Firmware Loader software installed on your computer, download it as follows:

1. Go to [www.extron.com/download](http://www.extron.com/download).
2. On the Download Center screen, click **Software** in the left sidebar menu.
3. On the next Download Center screen, locate and click the **Download** link for the latest version of Firmware Loader.



**Figure 13.** Firmware Loader Download Link

4. On the next screen, enter the requested information, then click the **Download fw\_loadernxnxn.exe** button (where n is the Firmware Loader version number).
5. Follow the instructions on the rest of the download screens to save the executable Firmware Loader installer file to your computer. Note the folder to which you saved the file.
6. In Windows Explorer or another file browser, locate the downloaded executable installer file and double-click it to open it.
7. Follow the instructions on the Installation Wizard screens to install the Firmware Loader to your computer. Unless you specify otherwise, the installer program places the Firmware Loader file at **C:\Program Files\Extron\FWLoader**.

## Using the Control Program to Update the Firmware

To upload the latest firmware to the MSW using the control program, do the following:

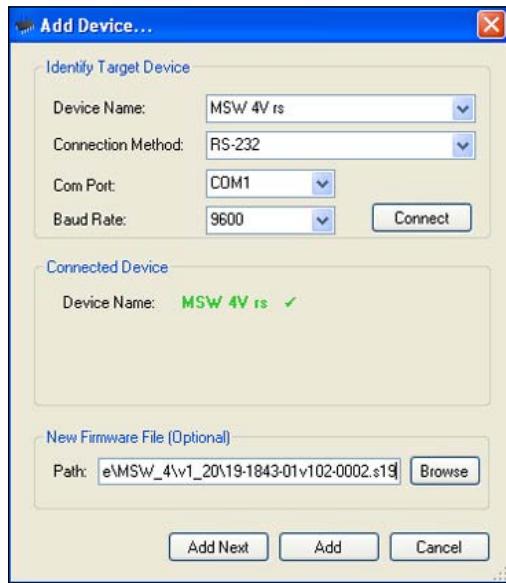
1. Open the Universal Switcher Control Program (see “[Using the software](#),” on page 10).
2. From the Configure menu, choose **Firmware Loader**.

**NOTE:** Firmware Loader must be installed on the PC for this option to work.



**Figure 14.** Choosing Firmware Loader

3. The Add Device window appears. On the Add Device window, select the appropriate device and connection method.



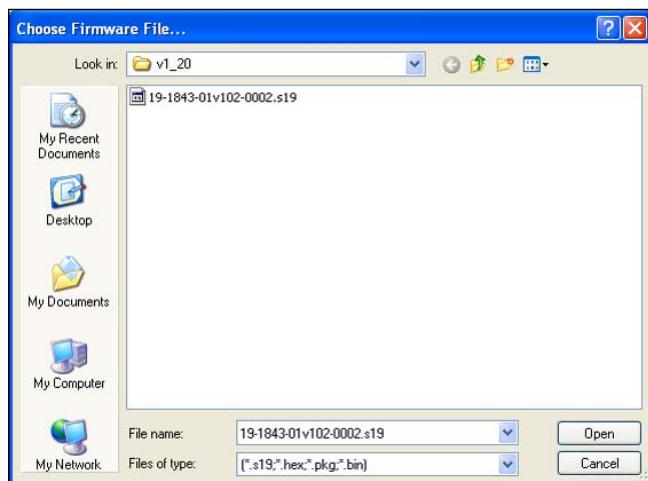
**Figure 15.** Add Device Window

4. From the remaining drop-down menus, select the appropriate port configuration parameters (obtained from your system administrator). The defaults are 9600 baud rate, no parity, 8 data bits, and one stop bit.

5. Click on the **Connect** button. The name of the selected device should appear in green text with a check mark next to it.

6. Click on the **Browse** button to locate the appropriate firmware file for the device. Select the file and click on the **Open** button. The file extension must be .S19.

**CAUTION:** Using a file with an incorrect extension may cause the unit to stop functioning.



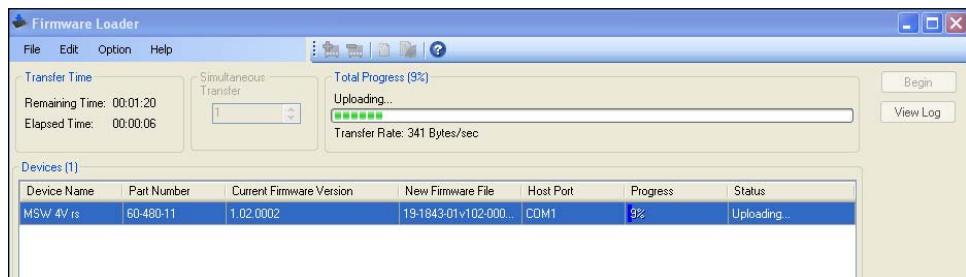
**Figure 16.** Choose Firmware File Window

7. If you will be uploading firmware to multiple MSW switchers, do the following:
  - a. Click **Add Next**. Your first device is added to the Devices field in Firmware Loader window, and the Add Device window remains open.
  - b. Enter the connection information for the device and click the **Connect** button.
  - c. Select the appropriate firmware for the device by using the **Browse** button.
  - d. Repeat steps **7a** through **7c** until all desired devices have been added to the Firmware Loader window.
8. When finished adding devices, click **Add**. The Add Device window closes, leaving the Firmware Loader window open with the added MSW devices highlighted and selected.
9. If you want to remove a device from the Firmware Loader window, do the following:
  - a. Highlight the names of the devices to be deleted from the Firmware Loader window.
  - b. Select Remove Selected Devices from the Edit menu.

To remove all devices from the Firmware Loader window, select **Remove All Devices** from the Edit menu.

**CAUTION:** Before clicking on the **Begin** button, check to make sure the appropriate firmware files is applied to the devices. Uploading a file with an incorrect extension may cause the unit to stop functioning.

10. Click **Begin** to start the firmware uploading process. While the firmware is being updated, a progress bar shows the status of the upload, while the Transfer Time field displays the time elapsed and the time remaining in the process. In addition, the percent of the file that has been uploaded is displayed in the Total Progress field until the entire firmware file is uploaded.



**Figure 17. Firmware Upload in Progress**

11. When the firmware update is finished, “Completed” appears above the progress bar in the Total Progress field. The Total Progress field displays “100%” and the status displays “Completed”. Close the Firmware Loader window.

**CAUTION:** If the Firmware Loader utility exits before the status bar has progressed completely across the indicator window, the firmware may be corrupted and may no longer respond to the Universal Switcher Control Program. If you experience problems with this procedure, call the Extron S<sup>3</sup> Sales and Technical Support Hotline.

# Specifications

## Video— MSW 4V rs, MSW 4SV rs

Gain.....	Unity
Bandwidth	
MSW 4V rs .....	300 MHz (-3 dB)
MSW 4SV rs .....	250 MHz (-3 dB)
Crosstalk .....	<-60 dB @ 3.58 MHz
Switching speed.....	20 ms (max.)

### Video input

Number/ signal type	
MSW 4V rs .....	4 composite video
MSW 4SV rs .....	4 S-video
Connectors	
MSW 4V rs .....	4 female BNC
MSW 4SV rs .....	4 female 4-pin mini DIN
Nominal level .....	1 Vp-p for Y of S-video and for composite video 0.3 Vp-p for C of S-video 0.8 Vp-p for SDI
Minimum/maximum levels.....	0.4 V to 2.0 Vp-p with no offset
Impedance .....	75 ohms
Return loss	
MSW 4V rs .....	<-40 dB, DC @ 10 MHz
MSW 4SV rs .....	<-25 dB, DC @ 10 MHz
DC offset (max. allowable) .....	5.0 V
Input coupling.....	DC

### Video output

Number/ signal type	
MSW 4V rs .....	2 composite video
MSW 4SV rs .....	1 S-video, 1 composite video
Connectors	
MSW 4V rs .....	2 female BNC
MSW 4SV rs .....	1 female BNC, 1 female 4-pin mini DIN
Nominal level .....	1 Vp-p for Y of S-video and for composite video 0.3 Vp-p for C of S-video 0.8 Vp-p for SDI
Minimum/maximum levels.....	0.4 V to 2.0 Vp-p
Impedance .....	75 ohms
Return loss .....	<-30 dB @ 5 MHz
DC offset .....	±5 mV maximum with input at 0 offset
Switching type .....	Vertical interval

## Sync

Standards..... NTSC 3.58, NTSC 4.43, PAL, SECAM

## Control/remote — switcher

Serial control port..... 1 RS-232, 3.5 mm captive screw connector, 5 pole  
Baud rate and protocol..... 9600 baud, 8 data bits, 1 stop bit, no parity  
Serial control pin configurations ..... 1 = TX, 2 = RX, 3 = GND  
Contact closure ..... (1) 3.5 mm captive screw connector, 5 pole  
Contact closure pin configurations . 1 = input 1, 2 = input 2, 3 = input 3, 4 = input 4, 5 = GND  
Program control ..... Extron Universal Switcher program for Windows  
Extron Simple Instruction Set (SIS)

## General

External power supply ..... 100 VAC to 240 VAC, 50-60 Hz, external, to 12 VDC, regulated  
Power input requirements ..... 12 VDC, 0.2 A  
Cooling ..... Convection, no vents  
Temperature/humidity ..... Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing  
Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing  
Mounting  
Rack mount ..... Yes, with optional 1U rack shelf  
Furniture mount ..... Yes, with optional mini under-desk mounting kit  
Enclosure type..... Metal  
Enclosure dimensions ..... 1.7" H x 4.3" W x 3.0" D (1U high, quarter rack wide)  
(4.3 cm H x 10.9 cm W x 6.5 cm D)  
(Depth excludes connectors.)  
Product weight..... 0.6 lbs (0.3 kg)  
Shipping weight..... 3 lbs (2 kg)  
Vibration ..... ISTA 1A in carton (International Safe Transit Association)  
Regulatory compliance  
Safety ..... CE, c-UL, CUL  
EMI/EMC ..... CE, C-tick, FCC Class A, ICES, VCCI  
MTBF ..... 30,000 hours  
Warranty..... 3 years parts and labor

**NOTE:** All nominal levels are at  $\pm 10\%$ .

**NOTE:** Specifications are subject to change without notice.

# SIS Commands

This section provides information about the Extron Simple Instruction Set (SIS) commands that are used to configure the switchers:

- [Introduction to SIS](#)
- [Symbols Used in this Guide](#)
- [Error messages](#)
- [Command and Response table for SIS commands](#)

## Introduction to SIS

The MSW 4V rs and MSW 4SV rs accept SIS commands from a control device connected to the RS-232 5-pole, rear panel captive screw connector (see [RS-232 connector](#)).

**NOTE:** The wiring in the RS-232 cables crosses over so that the Tx of one device connects to the Rx of the other and vice versa.

The RS-232 protocol is 9600 baud, 8 data bit, 1 stop bit, and no parity.

The SIS commands consist of one or more characters per field (a string). No special characters are required to begin or end a command character sequence. Unless otherwise stated, upper and lower case characters may be used interchangeably.

When a command is valid, the switcher executes the command and sends a response to the host device. All responses from the switcher to the host end with a carriage return and a line feed (CR/LF =  $\leftarrow$ ), which signals the end of the response character string.

Pauses of ten seconds or longer between command ASCII characters result in a timeout. The command operation is aborted with no other indication.

When a local event (such as a front panel operation or error condition) occurs, the switcher responds by sending a message to the host. The switcher-initiated messages are listed below:

The switcher issues the copyright message and the input selected message when it first powers on. Vx.xx is the firmware version number.

**(c) Copyright 2007, Extron Electronics, MSW Series Switchers, Vx.xx $\leftarrow$**

Vx.xx is the firmware version number.

The switcher sends the Inn message whenever the selected input is changed using the front panel buttons.

**Inn $\leftarrow$**

The second "n" is the input number.

## Symbols Used in this Guide

When programming in the field, certain characters are most conveniently represented by their hexadecimal rather than their ASCII values. The table below shows the hexadecimal equivalent of each ASCII character:

ASCII to HEX Conversion Table															
Space	20	!	21	"	22	#	23	\$	24	%	25	&	26	'	27
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
Ø	30	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	40	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	50	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	-	5F
.	60	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	70	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x	78	y	79	z	7A	{	7B		7C	}	7D	~	7E	DEL	7F

**Figure 18. ASCII to HEX Conversion Table**

↔ — Carriage return with line feed

● — Space character

← — Carriage return (no line feed)

Esc — Escape key

| (pipe character) is the same as ←

W is the same as Esc

**NOTE:** Upper and lower case characters can be used interchangeably in SIS commands for this product.

The **Xn** values defined in this section are the variables used in the fields of the command and response table.

**X1** — Input number (1 through 4)

**X2** — Input signal status: 0 = no signal detected, 1 = signal detected

**X3** — Status: 0 = off, 1 = on

**X4** — Switch mode: 1 = normal, 2 = auto switch

**X5** — Input number response (1 through 4)

## Error Messages

When the switcher receives a valid SIS command, it executes the command and sends a response to the host device. If the switcher is unable to execute the command because the command is invalid or it contains invalid parameters, the switcher returns an error response to the host. The error response codes are:

E01 — Invalid input channel number (out of range)

E06 — Invalid input channel change (auto switch is active)

E10 — Invalid command

E13 — Invalid parameter

## Command and Response Table for SIS Commands

Command	ASCII Command (host to unit)	Response (unit to host)	Additional Description
<b>Input selection</b>			
Select input	<b>[X1] !</b>	In[X1]↔	Selects input ([X1] 1 to 4)
<b>Input video sensing</b>			
Request status of all inputs	ØS	Sig•[X2]•[X2]•[X2]•[X2]↔	Each [X2] response is the signal status of an input, from input 1 to 4. [X2] = 0 (no signal) or 1 (signal detected).
<i>Example:</i>	ØS	Sig•1•0•0•1↔	Input 1 = signal present; input 2 = no signal present; input 3 = no signal present; input 4 = signal present.
Request the status of an individual input	[X1]S	[X2]↔	Signal status for input [X1] is [X2]
<b>Video mute</b>			
Mute or unmute video	[X3]B	Vmt[X3]↔	Toggles between video mute and unmute; [X3] = 0 (unmute) or 1 (mute).
Read mute status	B	[X3]↔	Shows mute status.
<b>Mode select</b>			
Normal/auto switch mode	[X4]#	F[X4]↔	Toggle between normal and autoswitch modes. [X4] = 1 (normal) or 2 (auto)
<b>Information Requests</b>			
General information	I	V[X5]•F[X4]•Vmt[X3]↔	For currently selected input [X5] (1 to 4) switcher is in [X4] mode (1 = normal, 2 = auto) and video mute status is [X3] (0 = unmute, 1 = mute).
<i>Example:</i>	I	V2•F1•Vmt0↔	Video is selected on input 2; switcher is in normal mode (F1); video mute is off.
Query firmware version	Q	x.xx↔	View the firmware version.
Query part number	N	60-480-xx↔	View the part number (60-480-11 or 60-480-12).
Upload firmware	[Esc]Upload↔	Go↔	Upload firmware.
System reset (factory default)	[Esc]Zxxx	Zpx↔	Resets unit to factory defaults.

# Parts and Accessories

## Included Parts

Description	Part Number
MSW 4V rs	60-480-11
MSW 4SV rs	60-480-12
PS 1210 C 12 VDC, 1.0 A universal power supply	70-775-01
IEC power cord	
Female 3.5 mm, 5-pole captive screw connectors	
Female 3.5 mm, 2-pole captive screw connectors (orange)	
Rubber feet (not attached)	
<i>MSW 4V rs and MSW 4SV rs • Setup Guide</i>	

## Optional Accessories

Description	Part Number
PS 124 12 VDC universal power supply	60-1022-01
CCR 204 Four-Button Contact Closure Remote	60-794-02
IR 102 Remote Control Kit	70-224-01
RSB 123 1U 3.5 inch Deep Basic Rack Shelf	60-604-21
RSF 123 1U 3.5 inch Deep Rack Shelf Kit	60-190-20
RSB 126 1U 6 inch Deep Basic Rack Shelf	60-604-11
RSU 126 1U 6 inch Deep Rack Shelf Kit	60-190-10
RSB 129 1U 9.5 inch Deep Basic Rack Shelf	60-604-02
RSU 129 1U 9.5 inch Deep Rack Shelf Kit	60-190-01
MBU 123 Low-profile Mount Kit	70-212-01

# Mounting

This section outlines the various options for mounting the MSW 4V rs and MSW 4SV rs:

- [Tabletop Placement](#)
- [Rack Mounting](#)
- [Under-desk Mounting](#)

## Tabletop Placement

Attach the four provided rubber feet to the bottom of the unit and place it in any suitable location.

## Rack Mounting the MSW 4V rs and MSW 4SV rs

### Underwriters Laboratories Guidelines for Rack Mounting

The following Underwriters Laboratories (UL) guidelines are relevant to the safe installation of these products in a rack:

**Elevated operating ambient temperature** — If the unit is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install the equipment in an environment compatible with the maximum ambient temperature (Tma: +122 °F, +45 °C) specified by Extron.

**Reduced air flow** — Install the equipment in the rack so that the equipment gets adequate air flow for safe operation.

**Mechanical loading** — Mount the equipment in the rack so that uneven mechanical loading does not create a hazardous condition.

**Circuit overloading** — Connect the equipment to the supply circuit and consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Give appropriate consideration to the equipment nameplate ratings when addressing this concern.

**Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (such as the use of power strips).

## **Rack Mounting the MSW 4V rs and MSW 4SV rs**

The MSW 4V rs and MSW 4SV rs can be mounted in any standard 19-inch equipment rack, using the optional Extron shelves or shelf kits.

- RSF 123 1U 3.5 inch Deep Rack Shelf Kit (part number **60-190-20**)
- RSB 123 1U 3.5 inch Deep Basic Rack Shelf (part number **60-604-21**)
- RSU 126 1U 6 inch Deep Universal Rack Shelf Kit (part number **60-190-10**)
- RSB 126 1U 6 inch Deep Basic Rack Shelf (part number **60-604-11**)
- RSU 129 1U 9.5 inch Deep Universal Rack Shelf Kit (part number **60-190-01**)
- RSB 129 1U 9.5 inch Deep Basic Rack Shelf (part number **60-604-02**)

Follow the instructions provided with the kit.

## **Under-desk Mounting the MSW 4V rs and MSW 4SV rs**

Mount the unit under a desk or podium, using the optional Extron MBU 123 low profile mounting kit (part number **70-212-01**) by following the instructions provided with the MBU 123 kit.

## Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase; touchscreen display and overlay components are covered for 1 year. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

### **USA, Canada, South America, and Central America:**

Extron Electronics  
1001 East Ball Road  
Anaheim, CA 92805  
U.S.A.

### **Europe, Africa, and the Middle East:**

Extron Europe  
Hanzeboulevard 10  
3825 PH Amersfoort  
The Netherlands

### **Asia:**

Extron Asia  
135 Joo Seng Road, #04-01  
PM Industrial Bldg.  
Singapore 368363  
Singapore

### **Japan:**

Extron Electronics, Japan  
Kyodo Building, 16 Ichibancho  
Chiyoda-ku, Tokyo 102-0082  
Japan

### **China:**

Extron China  
686 Ronghua Road  
Songjiang District  
Shanghai 201611  
China

### **Middle East:**

Extron Middle East  
Dubai Airport Free Zone  
F12, PO Box 293666  
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or modifications were made to the product that were not authorized by Extron.

**NOTE:** If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

**USA:** (714) 491-1500

**Asia:** 65.6383.4400

**Europe:** 31.33.453.4040

**Japan:** 81.3.3511.7655

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

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